

Biogeochemical Processes

Phytoplankton and nutrient trends in different areas of the western Mediterranean Sea

García-Martínez, M.C.¹, Moya, F.¹, Vargas-Yáñez, M.¹, López-Jurado, J.L.², Serra, M.², Tel, E.³, Balbín, R.², Aparicio, A.², Amengual, B.²

¹*Instituto Español de Oceanografía, IEO. Puerto Pesquero, s/n.29640-Fuengirola, Spain.*

²*Instituto Español de Oceanografía, IEO. Muelle de Poniente s/n 07015.-Palma Mallorca, Spain.*

³*Instituto Español de Oceanografía, IEO. C/Corazón de María, 8. 28002-Madrid, Spain.*

Abstract

In 1992, the Spanish Institute of Oceanography (IEO) started an environmental monitoring project, Ecomalaga, where three oceanographic sections were periodically visited. Each section was made of several oceanographic stations distributed on the on-off shore direction. In 1994 a similar project called "Radial de Baleares" started in the Balearic Islands. Three oceanographic stations in the South Western continental shelf of Mallorca Island were regularly visited.

A third monitoring program was devoted to the study of Murcia shelf waters. Since 2007, these three projects and the program CIRBAL, devoted to the monitoring of Balearic channels were merged, and the sampling area was extended to the whole Spanish Mediterranean, from Cabo Pino (close to Cádiz) to Barcelona. The resulting project is the ongoing RADMED Project funded by the Spanish Institute of Oceanography (IEO). In the framework of this project certain variables are systematically studied: temperature, salinity, nutrient and chlorophyll a concentration, phytoplankton and zooplankton abundance....

One of the main objectives of the project is to detect and quantify long-term changes in concentration levels of these variables. In the present work, seasonal time series of phytoplankton and nutrient concentrations from Malaga (Northwestern Alborán Sea) and Balearic Islands have been analysed in order to estimate changes and trends.

In the case of Ecomalaga stations, which are influenced by the Atlantic waters incoming through the Straits of Gibraltar, a decreasing trend in diatoms and dinoflagellata abundances is detected at all sampling depths, except at 75m where there's a strong positive trend in dinoflagellata abundance. On the contrary, the Balearic section shows an increasing trend at all depths both in diatoms and small flagellate, but a decreasing one in dinoflagellata.

Nutrient analysis revealed a strong increasing trend in integrated nutrient concentration in Balearic section, accompanied by a progressive sinking of the nutricline depth. On the other hand, in Malaga stations, no significative trend was found in nutricline depth, but a small negative one in integrated nutrient concentrations.

These results suggest a different answer to environmental forcing, depending on the study area.